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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/772,157

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EXAMINER

WILLS, MONIQUE M

ART UNIT

PAPER NUMBER

1795

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/772,157	<b>Applicant(s)</b> VISCO ET AL.	
	<b>Examiner</b> Monique M. Wills	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 5-7, 13, 14, 22, 24-43, 46, 47 and 64-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-12, 15-21, 23, 44 and 48-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/6/08, 2/6/08, 1/31/08</u> .                                 | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

This Office Action is responsive to the Amendment filed April 7, 2008. The rejection of claims 1-3, 8-12, 15-21, 23, 44-45, 48-49 & 50-59 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2005/0100792 (Visco) is overcome. The rejection of claims 60-62 under 35 U.S.C. 103(a) as being unpatentable over Visco U.S. Pub. 2005/0100792 in view of Gozdz U.S. Pub. 2001/0110728 is overcome. However, the instant claims are newly rejected as follows:

### ***Double Patenting***

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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2. Claims 1, 3, 44, 49, 50, 51-53 & 56-57 are a are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of copending Application No. 10/825,587 1-3, 5, 7-14, 19 and 23. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/825,587 claims an electrochemical cell comprising: a renewable active metal anode; a cathode structure comprising a electronically conductive component, an ionically conductive component, and a fluid oxidant; an ionically conductive protective membrane on the first surface of the anode, the membrane comprising, one or more materials configured to provide a first surface chemically compatible with the active metal of the anode in contact with the anode, and a second surface substantially impervious to and chemically compatible with the cathode structure and in contact with the cathode structure (Claim 1 as applied to instant claim 1).

The cathode structure employs water which is the active component (claim 1 and 5 as applied to claims 3). The anode material is lithium (claims 1, 9 and 14 as applied to claim 44).

The protective membrane is a composite comprising first and second materials having identical compositions (claim 2 as applied to claim 50) and the membrane has the same requisite ionic conductivity (claim 3 as applied to claim 49).

The membrane is a laminate (claim 7 as applied to claim 51) and has a graded composition (claim 8 as applied to claim 52).

The first component is a composite reaction product of active metal with  $\text{Cu}_3\text{N}$ , active metal halides, active metal phosphides and active metal halides and active metal phosphorous oxynitrides (claim 10 as applied to claim 53) or a composite reaction product of active material with  $\text{Cu}_3\text{N}$ ,  $\text{Li}_3\text{N}$ ,  $\text{Li}_3\text{P}$ , and  $\text{LiI}$ ,  $\text{LiBr}$ ,  $\text{LiCl}$ ,  $\text{LiF}$  and  $\text{LiPON}$  claim 11 as applied to claim 55).

The second composite comprises a material selected the group consisting of glassy or amorphous metal ion conductors, ceramic active metal ion conductors, and glass-ceramic active metal ion conductors (claim 12 as applied to claim 56) and has the same composition as that of claim 57 (see claim 13).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

3. Claims 1, 3, 9, 44 & 21, 50, 53 & 55 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 55-081471 A (JP '471).

JP '471 discloses a lithium/air cell comprising a lithium anode 4, a porous cathode 2 and a solid electrolyte 5 disposed between the cathode and anode (abstract and Fig. 1 as applied to generic claim 1).

$\text{Li}_3\text{N}$  is the same type of material disclosed in the instant application for one of the layers and thus is held to exhibit the same requisite ionic conductivity required in claim 3.

The anode is solid-state lithium (as applied to claims 9 and 14).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claim 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 as applied to claim 1 above, and further in view of U.S. Patent No. 5,314,765 (Bates).

The first material is Li<sub>3</sub>N which is an identical material to those claimed active metal nitrides and thus broadly reads on the Markush groups of claims 10 and 11).

The teachings of claim 1 have been discussed above and are incorporated herein.

JP '471 does not appear to expressly disclose of the conductive protective membrane being a that the membrane is a laminate (claim 50)

Bates teaches of providing a multilaminate composition comprising a first layer of Li<sub>3</sub>N and a top layer of LiPON thereon (Fig. and col. 2, ll. 50-65).

The addition of a top layer of LiPON to the system of JP '471 would have improved the life of operation of the cell of JP '471 by protecting the reactive anode from other components in the system.

5. Claims 2, 8, 11 & 12, 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 as applied to claim 1 above, and further in view of U.S. Patent No. 3976509 (Tsai).

JP '471 teaches an electrochemical cell as described hereinabove.

JP '471 does not appear to expressly disclose water as the cathode fluid oxidant.

While JP '471 discloses using air for the cathode fluid oxidant, use of other oxidant sources such as water in lithium electrochemical cells has been well established in the art as taught by Tsai (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 by using any number of cathode fluid oxidants including water since such materials have been established cathode fluids in the art as taught by Tsai and since it has been established that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

6. Claims 48- 49, 50, 54 & 56-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of Bates as applied to claim 12 above, and further in view of U.S. Patent No. 6,485,622 (Fu).

The difference not yet discussed is of the particular material of claim 50 for the second component. The reference is also silent to the cell configurations (58-63).

Fu teaches that the same lithium ion conductive glass-ceramic material is known in the art for use in lithium electrochemical cells (abstract as applied to claims 20 and 28). These materials include ionic conductivities of  $10^{-4}$  S/cm (Table 2),  $10^{-4}$  S/cm being held to be "about"  $10^{-3}$  S/cm (as applied to claim 7). The composition has an increased ionic conductivity as well as enhanced thermal stability within electrochemical devices.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '471 in view of Bates by selecting the second material to be the lithium ion conductive glass-ceramic material



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taught by Fu since it would have provided a material which provided both protection to the anode as well as increased the ionic conductivity of the protection composite in the cell. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

With respect to claims 58-63, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ a planar configuration or tubular configuration or capillary construction, because change in the shape of a component is prima facie obvious. Further, it is well known to employ lithium, primary or rechargeable batteries. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945)

7. Claim 10, 15-20, & 23, 52 & 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '471 in view of *McRae et al.* U.S. Pat. 3,607,417.

JP'471 does not expressly disclose a liquid electrolyte of aqueous solutions, the cathode on an electronically conductive porous catalytic support, wherein the support is nickel or the cell has an open cell voltage of at least 2 V.

McRae teaches a battery cell having a lithium metal anode 22, a nonaqueous electrolyte 23 adjacent the anode 22 (active material ion conducting separator layer), a cathode structure 26/27 and a cation permeable/water impermeable membrane 25 (impervious ionically conductive layer) adjacent the cathode structure 26/27. The

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nonaqueous electrolyte 23 may be, for example, dimethyl formamide or ethylene carbonate containing lithium tetrafluoroborate, lithium hexafluorophosphate or the like (5:44-62). See Figure 3. Claim 9 recites a glass composition of 83 mol%  $V_2O_5$ -10 mol%  $P_2O_5$ -6.5 mol%  $Li_2O$  as the impermeable membrane 25 (impervious ionically conductive layer). The cathode structure includes LiOH 26 and an air electrode 27. The air electrode may be catalytic lithiated nickel oxide supported on nickel (4:72-5:5). The chemical reaction of the battery cell are shown in column 5, lines 10-14. As shown, the cathode reaction includes water (aqueous).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the catalytic nickel support of McRae, in the electrochemical cell of JP'471, in order to improve structural integrity of the catalytic and electrode layers.

With respect to the employment of liquid electrolyte, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the aqueous electrolyte salt/solvent of McRae, in the electrochemical cell of JP'471, in order to increase ion conductivity between electrodes. The skilled artisan recognizes that liquid electrolytes permeate porous electrodes, increasing ion conductivity between.

With respect to an open cell voltage of at least 2V, it would be reasonable to expect that the cell possesses the instant open circuit voltage because the cells contain identical materials. In accordance with MPEP 2112.01, "[p]roducts of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical

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structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). In the instant case,

### ***Response to Arguments***

Applicant's arguments, with respect to the rejection(s) of claim(s) under Visco U.S. Pub. 2005/0100792 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the JP 55-081471 in the rejections recited above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Patrick Ryan, may be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Monique M Wills/  
Examiner, Art Unit 1795

/Stephen J. Kalafut/  
Primary Examiner, Art Unit 1795